What is claimed is:

1. A three-dimensional model selected from the group consisting of: (a) a three-dimensional model of a human IgE Fc region comprising Cε3 and Cε4 domains (Fc-Cε3/Cε4), wherein said model substantially represents the atomic coordinates specified in a Table selected from the group consisting of Table 1, Table 2 and Table 3; and (b) a three-dimensional model comprising a modification of said model of (a), wherein said modification represents an antibody Fc region that binds to a FcεRIα protein.

2. A method to produce the three-dimensional model of Claim 1, wherein the three-dimensional model represents the Fc-Cε3/Cε4 region of a human IgE antibody, said method comprising representing amino acids of said region at substantially the atomic coordinates specified in a Table selected from the group consisting of Table 1, Table 2 and Table 3.

3. A method to produce a three-dimensional model of a FcεRIα binding domain other than a human FcεRIα binding domain represented by the three-dimensional model substantially representing the atomic coordinates specified in Claim 1, said method comprising homology modeling.

4. An isolated crystal of a Fc-Cε3/Cε4 region of a human IgE antibody.

5. A method to produce the isolated crystal of Claim 4, said method comprising vapor diffusion.

6. An isolated Fc-Cε3/Cε4 protein selected from the group consisting of: (a) a protein consisting of SEQ ID NO:2; and (b) a homologous protein that is structurally homologous to a protein of (a), wherein said homologous protein binds to a FcεRIα protein.

7. A nucleic acid molecule comprising a nucleic acid sequence that encodes said isolated Fc-Cε3/Cε4 protein of Claim 6.

8. A recombinant molecule comprising the nucleic acid sequence of Claim 7.

9. A recombinant virus comprising the nucleic acid sequence of Claim 7.

10. A recombinant cell comprising the nucleic acid sequence of Claim 7.

11. A method to produce a protein comprising culturing the recombinant cell of Claim 10.

12. A method to identify a compound that inhibits the binding between an IgE antibody and a FcεRIα protein, said method comprising using a three-dimensional model of a Fc-Cε3/Cε4 region of a human IgE to identify said compound, wherein said model substantially represents the atomic coordinates specified in a Table selected from the group consisting of Table 1, Table 2 and Table 3.

13. An inhibitory compound identified in accordance with the method of Claim 12.

14. A therapeutic composition comprising the inhibitory compound of Claim 13.

15. A method to protect an animal from allergy, said method comprising administering to said animal the inhibitory compound of Claim 13.

16. A method to improve a function of an antibody comprising a Fc-Cε3/Cε4 region, said improved function being selected from the group consisting of increased stability, increased affinity for an IgE binding domain of a FcεRIα protein, altered substrate specificity, and increased solubility, said method comprising:

(a) analyzing a three-dimensional model substantially representing the atomic coordinates specified in a Table selected from the group consisting of Table 1, Table 2 and Table 3 to identify at least one amino acid of the Fc-Cε3/Cε4 region represented by said model which if replaced by said identified amino acid(s) improves at least one of said functions of said Fc-Cε3/Cε4 region; and

(b) replacing said identified amino acid(s) to produce a mutein having at least one of said improved functions.

17. A mutein produced by the method of Claim 16, wherein said mutein has an improved function compared to a Fc-Cε3/Cε4 protein comprising amino acid sequence SEQ ID NO:2, wherein said improved function is selected from the group consisting increased stability compared to the stability of a human IgE Fc region comprising amino acid sequence SEQ ID NO:2, increased affinity for a FcεRIα protein compared to the FcεRIα affinity of a human IgE Fc region comprising amino acid sequence SEQ ID NO:2, altered substrate affinity compared to the affinity for human FcεRIα of a human IgE Fc region comprising amino acid sequence SEQ ID NO:2, and increased solubility compared to the solubility of a human IgE Fc region comprising amino acid sequence SEQ ID NO:2.

18. A polypeptide selected from the group consisting of a FcεRIα binding domain, an interdomain groove between the two Cε3/Cε4 domains of said antibody Fc region, a hinge between Cε3 and Cε4 domains of said antibody Fc region, and a region of a Cε3 or Cε4 domain, the relative position of which changes by greater than 1 angstrom between closed and receptor-bound Fc-Cε3/Cε4 conformations.

19. The polypeptide of Claim 18, wherein said composition is selected from the group consisting of a linker between Cε2 and Cε3, a BC loop of Cε3, a DE loop of Cε3, and a FG loop of Cε3, a loop or strand defining the interdomain groove, a AB helix of Cε3 and, a region lying above said AB helix of Cε3.

20. An isolated nucleic acid molecule encoding the polypeptide of Claim 18.